# RA EIS Caliente Rail Alignment

# Wetland Reconnaissance Technical Memo

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## APPENDICES

# 1 Introduction

On January 23 through January 24, 2007, field scientists from Bechtel SAIC Company (BSC) and Potomac Hudson Engineering (PHE) Inc., conducted an investigation for the presence of wetlands along selected alignments of the proposed Caliente Rail Corridor (CRC), a single track rail line intended to transport nuclear fuel and high level radioactive waste to the proposed Yucca Mountain Nuclear repository site (PBS&J 2006). The purpose of the wetland reconnaissance was to determine if wetlands or other waters of the United States (e.g., washes, streams, playas), as shown by the National Wetlands Inventory map, exist near the rail alignment or would be affected by the Proposed Action.

Because the U.S. Department of Energy (DOE), Office of Civilian Radioactive Waste Management is analyzing Yucca Mountain as a site for the long-term repository for the Nation's spent nuclear fuel, it is evaluating possible environmental impacts resulting from constructing, maintaining and transporting nuclear fuel and/or high level radio active waste to the Yucca Mountain repository site. The CRC originates at a junction on the Union Pacific Railroad (UPRR) mainline near the town of Caliente, Nevada, and extends west across Lincoln, Nye, and Esmeralda counties to the Yucca Mountain site. The total length of the project area is 504.8 miles, which includes the different alignments within the CRC. The project would consist of the construction of a single-track rail line, sidings, service road, staging yard, and operational interface area with the UPRR (PBS&J 2006).

There is some uncertainty to the specific location (i.e., latitude and longitude) of some surface water features, specifically Willow Springs. Two springs having the potential to be Willow Springs are in close proximity of each other. Consequently, areas were investigated, and labeled as Lower Willow Springs and Upper Willow Springs. Notes documenting biotic and abiotic conditions of the springs, the surrounding environment, and of the plant species occupying the landscape were recorded in a field notebook and are presented in the Discussion of Findings section. Photographs were taken to illustrate the physical setting and are presented in Appendix A.

A complete list of areas investigated for potential wetlands and "other waters" of the United States are provided below:

- Dry Lake Valley
- Pahroc Unnamed Spring Near Blackrock Spring
- Coal Valley
- Mud Lake Playa
- Lower Willow Springs
- Upper Willow Springs
- Cole Springs
- Stonewall Flat Playa

Results of the field investigations indicate the absence of Army Corps of Engineers jurisdictional wetlands and other waters of the United States from the proposed rail alignment. Potential water resources that were encountered (i.e., springs) are generally 150 meters (492 feet) or more away from the rail alignment. Wetlands and other waters of the United States that were encountered appear isolated with no nexus to interstate commerce. Field ecologists identified plants to the genera and specie taxonomic level when identifiable traits were present, and to the genera taxonomic level when the identifying characteristics were absent. A plant's tendency for occurring in wetlands was also determined by reviewing the U.S. Fish and Wildlife Service's *National List of Vascular Plant Species That Occur in Wetlands* (Region 8). Vegetation not having a wetland indicator designation (i.e., facultative, facultative wet, obligate) is considered a non-wetland plant, and is assigned a not listed (*NL*) designation.

A description of the conditions encountered during the field investigations are presented in the sections below.

# 2 Discussion of Findings

## 2.1 Dry Lake Valley

The landscape encompassing Dry Lake Playa is mostly flat and has a slight topographic relief. A sparsely to moderately vegetated shrub cover type forms the dominant plant community. A list of plant species identified in Dry Lake Valley is presented in Table 1. Wetland hydrology is absent from the study area, and the surface soils exhibit a bright color, confirming the absence of a reducing environment. Therefore, there are no surface water resources, including wetlands that would be affected by the Proposed Action. Photographs 1 and 2 in Appendix A show upland vegetation common to the region of influence and the absence of wetland criteria.

**Table 1 - List of Plants Found at Dry Lake Valley**

| Common Name | Botanical Name | Wetland Indicator Status |
|---|---|---|
| Russian Thistle | *Salsola spp. (abundant along roads)* | NL |
| Green Rabbitbrush | *Chrysothamnus viscidiflorus (widely scattered)* | NL |
| Big Sagebrush | *Artemisia tridentate (common in depressions and wetter areas)* | NL |
| Cheatgrass | *Bromus tectorum (common)* | NL |
| Four-wing Saltbrush | *Atriplex canescens (common)* | UPL |
| Prickly Pear | *Opuntia spp. (widely scattered)* | NL |
| Winterfat | *Krascheninnikovia lanata* | NL |
| Galleta Grass | *Pleuraphis jamesii (widely scattered)* | NL |
| Rubber Rabbitbrush | *Ericameria nausiosa (abundant in depressions and wetter areas)* | NL |

Plants assigned a Facultative indicator status occur in wetlands 33 to 66 percent of the time
Plants assigned a Facultative Wet indicator status occur in wetlands 67 to 99 percent of the time
Plants assigned an Obligate indicator status occur in wetlands greater than 99 percent of the time
A "+" indicate a trend towards wetter conditions and a "-" indicate a trend towards drier conditions
NL Not Listed

## 2.2 Pahroc Unnamed Spring Near Blackrock Spring

Vegetation immediately bordering the spring is grazed to the ground surface by either livestock or wildlife, and lack identifiable plant characteristics (e.g., seed head, stem, ligules). Consequently, it is not feasible to positively identify the vegetation to the species level. Vegetation present appears to be a type of rush (*Juncus sp.*), and is abundant. A list of plant species from the surrounding uplands is presented in Table 2. Wetland hydrology is absent from a large part of the study area; however, it is represented by snow pack when present. The surface soils from the upland environment exhibit a bright color, confirming the absence of a reducing environment. There are no surface water resources impacts anticipated from the rail alignment because efforts were undertaken to avoid this water resource. Photograph 3 in Appendix A shows the wetland basin covered by snow, and Photograph 4 in Appendix A shows a large juniper in the adjacent uplands.

**Table 2 - List of Plants Found at Pahroc Unnamed Spring and Surrounding Area**

| Common Name | Botanical Name | Wetland Indicator Status |
|---|---|---|
| Big sagebrush | *Artemisia tridentata* (abundant) | NL |
| Fremont's mahonia | *Berberis fremontii* (widely scattered) | NL |
| Cheatgrass | *Bromus tectorum* (widely scattered) | NL |

| | | |
|---|---|---|
| Green rabbitbrush | *Chrysothamnus viscidiflorus* (common) | NL |
| Nevada jointfir | *Ephedra nevadensis* (widely scattered) | NL |
| Apache plume | *Fallugia paradoxa* (widely scattered) | NL |
| Rush | *Juncus sp.* (abundant) | FACW |
| Juniper | *Juniperous sp.* (common) | NL |
| Basin Wildrye | *Leymus cinereus* (common near spring just above earthen water tank) | NI |
| Bitterbrush | *Purshia spp.* (common) | NL |

Plants assigned a Facultative indicator status occur in wetlands 33 to 66 percent of the time
Plants assigned a Facultative Wet indicator status occur in wetlands 67 to 99 percent of the time
Plants assigned an Obligate indicator status occur in wetlands greater than 99 percent of the time
A "+" indicate a trend towards wetter conditions and a "-" indicate a trend towards drier conditions
NL Not Listed
NI Not an Indicator

## 2.3 Coal Valley

The landscape encompassing Coal Valley is mostly flat and possesses a slight change in topographic elevation from east to west. A sparsely to moderately vegetated shrub community forms the dominant cover type, and is colonized by non-wetland plans. Wetland hydrology is absent. The surface soils also exhibit a bright matrix chroma color, confirming the absence of a reducing environment. Consequently, there are no surface water resources near the rail alignment that would be affected by the Proposed Action. Table 3 summarizes a list of plants commonly encountered in Coal Valley. Photographs 5 and 6 in Appendix A show desert plants common to the region of influence and the absence of wetland criteria.

**Table 3 - List of Plants Found at Coal Valley and Surrounding Area**

| Common Name | Botanical Name | Wetland Indicator Status |
|---|---|---|
| White Burrobush | *Ericameria spp.* (widely scattered) | NL |
| Four-wing Saltbrush | *Atriplex canescens* (common) | UPL |
| Cheatgrass | *Bromus tectorum* (common along roadside) | NL |
| Indian Rice Grass | *Achnatherum hymenoides* (widely scattered) | UPL |
| Winterfat | *Krascheninnikovia lanata* (abundant) | NL |
| Russian Thistle | *Salsola spp.* (dominant along roadside) | NL |
| Shadscale Saltbrush | *Atriplex confertifolia* (common) | NL |
| Longspine Horsebrush | *Tetradymia axillaris* (rare) | NL |
| Tall Tumblemustard | *Sisymbrium altissimum* (common) | FACU- |

Plants assigned a Facultative indicator status occur in wetlands 33 to 66 percent of the time
Plants assigned a Facultative Wet indicator status occur in wetlands 67 to 99 percent of the time
Plants assigned an Obligate indicator status occur in wetlands greater than 99 percent of the time
Plants assigned a Facultative Upland indicator status occur in wetlands 1 to 33 percent of the time
A "+" indicate a trend towards wetter conditions and a "-" indicate a trend towards drier conditions
NL Not Listed

## 2.4 Mud Lake Playa

A few widely scattered pale desert-thorn plants (*Lycium pallidum)* were observed around the edges of Mud Playa. One Four-wing Saltbush (*Atriplex canescens*) (sparse) is growing about 100 yards into the playa from the edge. Except for the *A. canescens*, the playa is essentially devoid of vegetation. Desert pavement and an upland scrub-shrub fringe border Mud Lake. Desiccation cracks are dominant throughout the playa, and could represent relic hydrologic conditions. No recent indicators of wetland hydrology were observed within the playa and adjacent areas; however, several first order ephemeral washes were observed draining into Mud Lake from the north. The surface soils exhibit a bright matrix chroma, suggesting the absence of reducing environment. Photographs 7 through 10 in Appendix A show that no surface water resources are within the study area. Table 4 presents a list of plant species commonly colonizing the surrounding uplands and rock outcrops.

**Table 4 - List of Plants Bordering Mud Lake Playa and Surrounding Area**

| Common Name | Botanical Name | Wetland Indicator Status |
|---|---|---|
| Indian Ricegrass | *Achnatherum hymenoides* (common) | UPL |
| Four-wing Saltbush | *Atriplex canescens* (common) | NL |
| Cheatgrass | *Bromus tectorum* (widely scattered) | NL |
| Cooper'sHeathgoldenrod | *Ericameria cooperi* (common) | NL |
| Rubber Rabbitbrush | *Ericameria nauseosa* (common) | NL |
| Spiny Hopsage | *Grayia spinosa* (common) | NL |
| Broom Snakeweed | *Gutierrezia sarothrae* (common) | NL |
| White Burrobrush | *Hymenoclea salsola* (widely scattered) | NL |
| Spiny Menodora | *Menodora spinescens* (common) | NL |
| Galleta Grass | *Pleuraphis jamesii* (widely scattered) | NL |
| Sand Dropseed | *Sporobolus cryptandrus* (widely scattered) | FACU- |
| Pale Desert-thorn | *Lycium pallidum* (widely scattered) | NL |

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Plants assigned a Facultative Wet indicator status occur in wetlands 67 to 99 percent of the time
Plants assigned an Obligate indicator status occur in wetlands greater than 99 percent of the time
Plants assigned a Facultative Upland indicator status occur in wetlands 1 to 33 percent of the time
A "+" indicate a trend towards wetter conditions and a "-" indicate a trend towards drier conditions
NL Not Listed

## 2.5 Lower Willow Springs

There are two springs in close proximity to each other that could be identified as Willow Springs. Because there is some uncertainty to the specific location of Willow Springs (i.e., latitude and longitude), both areas were investigated and the physical and biological traits of each site were recorded in a field notebook. Wetland vegetation immediately bordering Lower Willow Springs is grazed to ground level by either livestock or wildlife and, in many cases, lacks identifiable traits (e.g., seed head, stem, ligule). The spring also appears to be highly degraded. Animal tracks and waste were commonly encountered in the wetter portions of the spring. Hydrophytes observed generally consisted of rush (*Juncus sp.*) and salt grass (*Distichlis spicata*). It is feasible that once the growing season starts, a more diverse plant community will emerge in the wetland area. Wetland hydrology at the spring consists of saturation at the ground surface, drainage patterns, and standing water with a depth of 0-7.6 centimeters (0-3 inches). As mentioned, the spring has been extremely degraded by livestock or wildlife. Water quality appears to be nutrient rich and stagnant. Lower Willow Springs is greater than 150 meters from the rail alignment and will not be affected by the Proposed Action. Table 5 summarizes a list of wetland and upland plants commonly encountered at the site. Photograph 11 in Appendix A shows the degradation of the spring by grazing livestock and Photograph 12 in Appendix A shows an ephemeral wash located south of the spring.

**Table 5 - List of Plants Found at Lower Willow Springs and Surrounding Area**

| Common Name | Botanical Name | Wetland Indicator Status |
|---|---|---|
| Rush | *Juncus sp.* (abundant around spring - grazed) | FACW |
| Saltgrass | *Distichlis spicata* (common around spring - grazed) | FAC+ |
| Shadscale Saltbush | *Atriplex confertifolia* (common) | NL |
| Cholla | *Cylindropuntia spp.* (widely scattered) | NL |
| Rubber Rabbitbrush | *Ericameria nauseosa* (abundant) | NL |
| Joshua Tree | *Yucca brevifolia* (widely scattered) | NL |

Plants assigned a Facultative indicator status occur in wetlands 33 to 66 percent of the time
Plants assigned a Facultative Wet indicator status occur in wetlands 67 to 99 percent of the time
Plants assigned an Obligate indicator status occur in wetlands greater than 99 percent of the time
Plants assigned a Facultative Upland indicator status occur in wetlands 1 to 33 percent of the time
A "+" indicate a trend towards wetter conditions and a "-" indicate a trend towards drier conditions
NL Not listed

## 2.6 Upper Willow Springs

As mentioned in the previous section, there are two springs in close proximity to each other that could be identified as Willow Springs. Because there is some uncertainty to the specific location (i.e., latitude and longitude) of Willow Springs, both areas were investigated, and the biotic and abiotic conditions were recorded in a field notebook. Photographs were also taken to document the existing conditions of this spring. The headwater for Upper Willow Springs emerges from the base of a rock outcrop and is piped down slope for approximately 23 meters (75 feet). A wetland develops at the point where water emerges from the pipe and extends down slope for an undetermined distance. An ephemeral wash eventually conveys seasonal water away and down slope of its source. Vegetation was difficult to identify because livestock grazed it to the ground surface, and the identifiable parts (e.g., seed head, stem, ligules) are absent. Hydrophytes generally consist of a type of rush (*Juncus sp.*) and salt grass (*Distichlis spicata*). It is feasible that a more diverse plant community will emerge once the growing season commences, especially if an enclosure fence to keep livestock out, were constructed around the wetland. Table 6 summarizes a list of wetland and upland plants encountered at Upper Willow Springs and surrounding areas.

Wetland hydrology at the spring consists of saturation at the ground surface, drainage patterns, and standing water with a depth of 0-7.6 centimeters (0-3 inches) or more. Water quality appears to be nutrient rich and somewhat stagnant and degraded by livestock or wildlife. A watering trough was also observed at the site. Upper Willow Springs is approximately 150 meters away from the rail alignment and will not be affected by the Proposed Action. Photographs 13 through 16 in Appendix A shows bordering of Upper Willow Springs at the time of the field investigation.

**Table 6 - List of Plants Found at Upper Willow Springs and Surrounding Area**

| Common Name | Botanical Name | Wetland Indicator Status |
|---|---|---|
| Rush | *Juncus sp.* (abundant around spring - grazed) | FACW |
| Saltgrass | *Distichlis spicata* (common around spring - grazed) | FAC+ |
| Cheatgrass | *Bromus tectorum* (widely scattered) | NL |
| Nevada Jointfir | *Ephedra nevadensis* (common) | NL |
| Rubber Rabbitbrush | *Ericameria nauseosa* (abundant) | NL |
| White Burrobrush | *Hymenoclea salsola* (common) | NL |
| Joshua Tree | *Yucca brevifolia* (widely scattered) | NL |

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Plants assigned a Facultative Wet indicator status occur in wetlands 67 to 99 percent of the time
Plants assigned an Obligate indicator status occur in wetlands greater than 99 percent of the time
Plants assigned a Facultative Upland indicator status occur in wetlands 1 to 33 percent of the time
A "+" indicate a trend towards wetter conditions and a "-" indicate a trend towards drier conditions
NL Not listed

## 2.7 Cole Springs

Cole Springs emerges from the base of a rock outcrop and is piped down slope for approximately 50 feet (15 meters) into a small topographic depression. As with Lower and Upper Willow Springs, vegetation at Cole Springs is difficult to identify because livestock or wildlife have grazed the biomass to the ground surface, and the identifiable parts (e.g., seed head, stem, ligules) are absent. However, hydrophytes present generally consist of a type of rush (*Juncus* sp.) and salt grass (*Distichlis spicata*). Wetland hydrology consists of drainage patterns and evidence of surface water retention. Table 7 provides a list of plants commonly encountered Cole Springs and the surrounding upland areas. There are no surface water resources near the rail alignment that will be affected by the Proposed Action. Photographs 17 and 18 in Appendix A shows the bordering of Cole Springs at the time of the field investigation.

**Table 7 - List of Plants Found at Cole Springs and Surrounding Area**

| Common Name | Botanical Name | Wetland Indicator Status |
|---|---|---|
| Rush | *Juncus sp.* (abundant around spring - grazed) | FACW |
| Saltgrass | *Distichlis spicata* (common around spring - grazed) | FAC+ |
| Shadscale Saltbush | *Atriplex confertifolia* (common) | NL |
| Cholla | *Cylindropuntia spp.* (widely scattered) | NL |
| Rubber Rabbitbrush | *Ericameria nauseosa* (abundant) | NL |
| Joshua Tree | *Yucca brevifolia* (widely scattered) | NL |

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Plants assigned a Facultative Wet indicator status occur in wetlands 67 to 99 percent of the time
Plants assigned an Obligate indicator status occur in wetlands greater than 99 percent of the time
Plants assigned a Facultative Upland indicator status occur in wetlands 1 to 33 percent of the time
A "+" indicate a trend towards wetter conditions and a "-" indicate a trend towards drier conditions
NL Not listed

## 2.8 Stonewall Flat Playa

Stonewall Flat Playa is devoid of vegetation, and contains desiccation cracks throughout the basin. The desiccation cracks probably reflect relic conditions that have occurred in the past. No indicators of recent wetland hydrology were observed within the playa and adjacent areas, and little to no vegetation was observed within the playa. Furthermore, the surface soils exhibit a bright color, confirming the absence of a reducing environment. Therefore, no surface water resources exist near the rail alignment that would be affected by the Proposed Action. Table 8 summarizes a list of plants commonly encountered in the uplands bordering Stonewall Flat Playa. Photographs 19 and 20 in Appendix A shows the barren conditions of Stonewall Flat Playa at the time of the field investigation.

**Table 8 - List Plants Bordering Stonewall Flat Playa and Surrounding Area**

| Common Name | Botanical Name | Wetland Indicator Status |
|---|---|---|
| Shadscale Saltbush | *Atriplex confertifolia* (abundant) | NL |
| Cooper's Heathgoldenrod | *Ericameria cooperi* (common) | NL |
| Winterfat | *Krascheninnikovia lanata* (common) | NL |
| Kochia | *Kochia spp.* (common, primarily occurred around playa edges) | NL |
| Russian Thistle | *Salsola spp.* (rare) | NL |
| Tall Tumblemustard | *Sisymbrium altissimum* (rare) | FACU- |

Plants assigned a Facultative indicator status occur in wetlands 33 to 66 percent of the time
Plants assigned a Facultative Wet indicator status occur in wetlands 67 to 99 percent of the time
Plants assigned an Obligate indicator status occur in wetlands greater than 99 percent of the time
Plants assigned a Facultative Upland indicator status occur in wetlands 1 to 33 percent of the time
A "+" indicate a trend towards wetter conditions and a "-" indicate a trend towards drier conditions
NL Not listed

# 3 Summary of Findings

The field reconnaissance confirmed wetland criteria (hydric soils, hydrophytic vegetation and wetland hydrology) were absent from the areas investigated. Field investigations for "other waters" (streams, lakes or washes) were also deemed absent from the areas that must be disturbed during construction. Potential wetlands or other waters were generally greater than 150 meters (492 feet) away from the rail alignment. These wetlands were isolated with no nexus to interstate commerce, and thus are not within the jurisdiction of the U.S. Army Corps of Engineers. Therefore, no surface water resources, including wetlands will be directly affected by the Proposed Action.

# Appendix A

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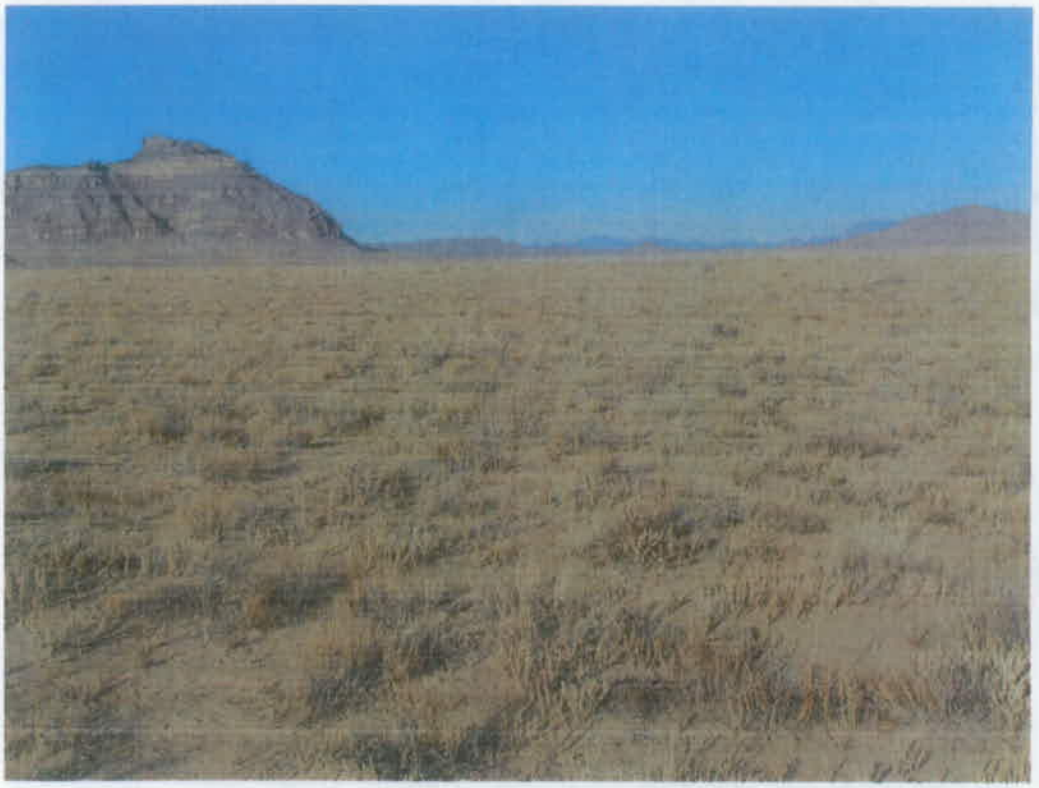
Photograph 1: Dry Lake Playa, Looking East From West Side of Playa

Photograph 2: Dry Lake Playa, Looking Southeast From West Side of Playa

Photograph 3: Looking Down Slope from the Pahroc Unnamed Spring

Photograph 4: Looking at a Juniper Tree, West of the Pahroc Unnamed Spring



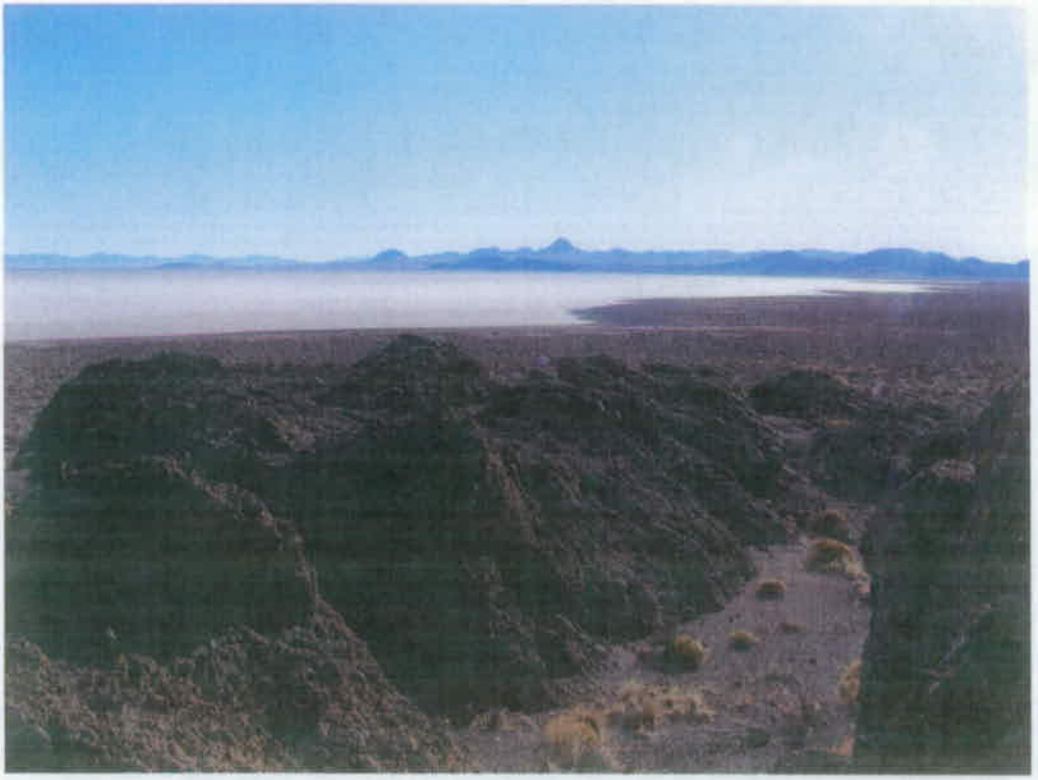
Photograph 5: Coal Valley Looking North

Photograph 6: Coal Valley Looking Southeast from North End of Playa

Photograph 7: Looking at Upland Shrub Fringe Bordering Mud Lake Playa

Photograph 8: Looking at Desert Pavement Bordering Mud Lake Playa

Photograph 9: Looking at Desiccation Cracks Within Mud Lake



Photograph 10: Looking at Mud Lake from the Summit of a Rock Outcrop

Photograph 11: Lower Willow Springs, Looking at Ponded Water and Salt Crust

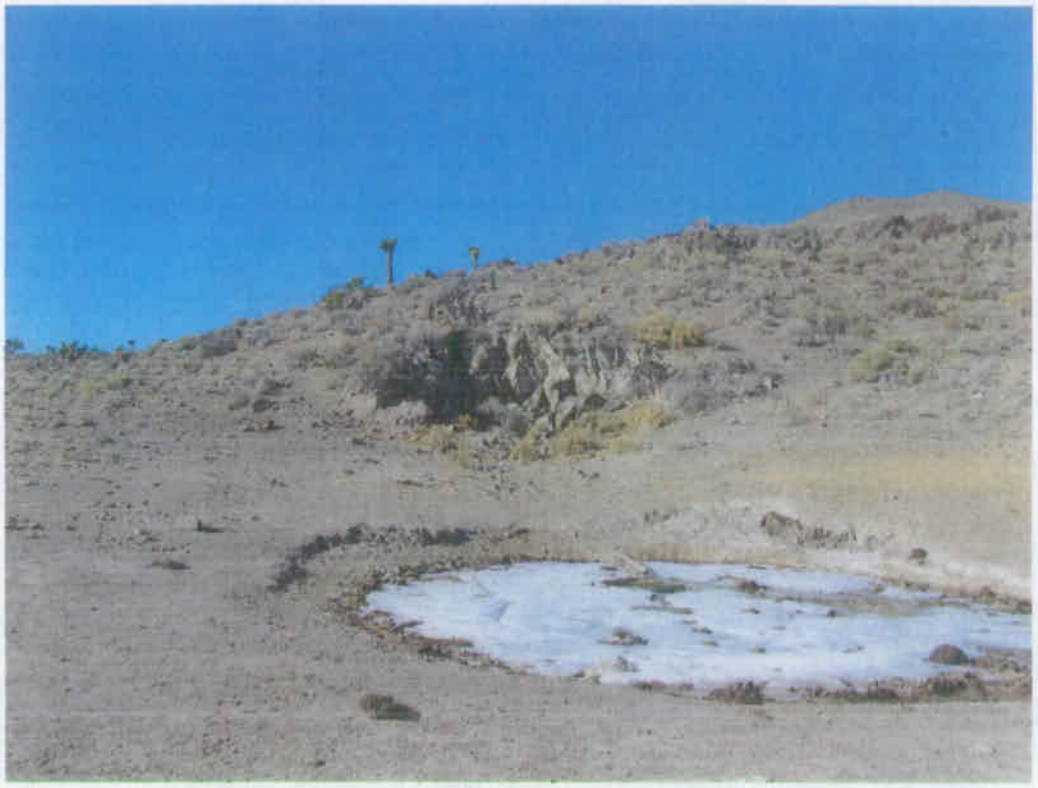
Photograph 12: Lower Willow Springs, Looking at a Wash that Drains Lower Willow Springs Eastward and then South

Photograph 13: Upper Willow Springs, Looking East at Watering Trough and Wetland

Photograph 14: Upper Willow Springs, Looking at Ponded Water and Submerged Vegetation

Photograph 15: Upper Willow Springs, Looking Towards the Headwater of the Spring

Photograph 16: Upper Willow Springs, Looking at Headwater



Photograph 17: Looking West at Cole Springs and Headwater

Photograph 18: Cole Springs, Looking Eastward at Pipe and Ponded Water

Photograph 19: Stonewall Flat Playa, Looking East at Stonewall Mountain

Photograph 20: Stonewall Flat Playa, Looking South

# Appendix B

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# References

PBS&J 2006. *Waters of the U.S. Jurisdictional Determination Report for Yucca Mountain Project – Caliente Rail Corridor*. Henderson, Nevada: PBS&J. ACC: ENG.20060308.0003.

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